

Chem!stry

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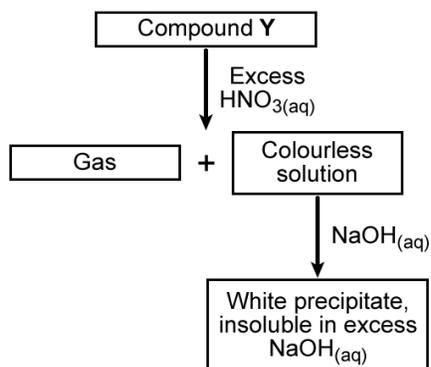
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Questions on Qualitative Analysis – Assignment 6 – Answers

Question 1:

The scheme below shows some reactions of a compound Y:



What is the identity of compound Y?

- A Zinc carbonate.
- B Aluminium sulfate.
- C Calcium carbonate.
- D Copper(II) carbonate.

Question 2:

A solution containing Pb^{2+} can be distinguished from a solution containing Zn^{2+} by adding any of the following solutions, *except*.

- A Aqueous sodium hydroxide.
- B Dilute sulphuric acid.
- C Aqueous sodium sulphate.
- D Dilute hydrochloric acid.

Question 3:

Two aqueous solutions, X and Y, are mixed together. Which one of the following pairs would *not* give a white precipitate?

- | | | |
|---|-----------------------|----------------------|
| A | X = barium nitrate | Y = sodium sulfate |
| B | X = calcium nitrate | Y = sodium carbonate |
| C | X = lead(II) nitrate | Y = sodium chloride |
| D | X = magnesium nitrate | Y = sodium sulfate |

Question 4:

A solution **X** formed a white precipitate with both dilute sulfuric acid and with aqueous silver nitrate. What could solution **X** contain?

- A** Barium chloride **B** Barium nitrate
C Magnesium chloride **D** Magnesium sulfate

Question 5:

An aqueous solution of an unknown salt gives the following results when added to the reagents:

Reagent	Result
Aqueous sodium hydroxide	Green precipitate that slowly turns brown
Aqueous barium nitrate	White precipitate

Which one of the following is the unknown salt?

- A** FeCl₂ **B** FeSO₄
C Fe₂(SO₄)₃ **D** CuSO₄

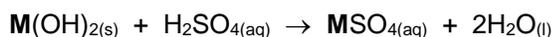
Question 6:

Which one of the following metallic ions forms a white hydroxide which dissolves in excess aqueous sodium hydroxide but *not* excess aqueous ammonia?

- A** Al³⁺ **B** Ca²⁺
C Cu²⁺ **D** Zn²⁺

Question 7:

An aqueous solution of a sulfate is made from a solid hydroxide, of metal **M**, by the following reaction:



For which hydroxide would this method *not* work?

- A** Barium hydroxide **B** Copper(II) hydroxide
C Iron(II) hydroxide **D** Magnesium hydroxide

Question 8:

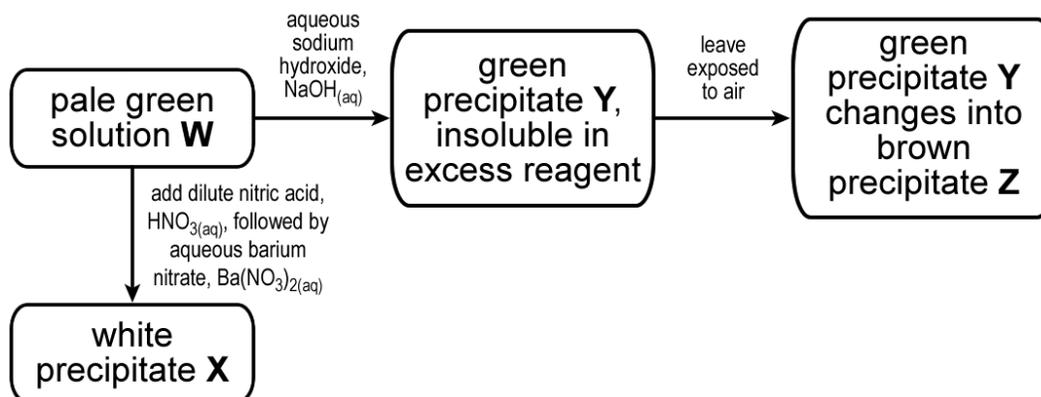
The results on some fertiliser **X** are listed below:

- i)** Warming **X** with aqueous sodium hydroxide produced a gas which turned damp red litmus paper blue.
ii) Mixing aqueous **X** with acidified barium chloride did *not* give a white precipitate.
iii) Mixing aqueous **X** with acidified silver nitrate gave a white precipitate.

Which ions does fertiliser **X** contain?

- A** NH₄⁺ and NO₃⁻ **B** NH₄⁺ and SO₄²⁻
C NH₄⁺ and Cl⁻ **D** K⁺ and NO₃⁻

Study the reaction sequence given below:



a) Identify the chemicals **W**, **X**, **Y** and **Z** by writing their formulae in the spaces provided below:

W is Iron(II) sulfate, FeSO_4

X is Barium sulfate, BaSO_4

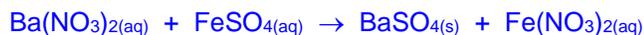
Y is Iron(II) hydroxide, Fe(OH)_2

Z is Iron(III) hydroxide, Fe(OH)_3

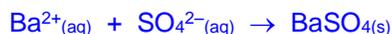
b) Write the balanced chemical equation for the reaction between **W** and aqueous sodium hydroxide to form **Y**:



c) i) Write the balanced chemical equation for the reaction between **W** and aqueous barium nitrate to form **X**:



ii) Write the ionic equation for the reaction between **W** and aqueous barium nitrate to form **X**:



Question 11:

The following table shows the tests that a student did on a solution of substance **H**, and the deductions made from the observations. Complete the table by describing the *observations* that led to each of the deductions:

Test	Observation	Deduction
1 a) Add aqueous sodium hydroxide until a change is observed. b) Add excess aqueous sodium hydroxide.	1 a) A light blue precipitate is formed. b) The light blue precipitate is insoluble in excess reagent.	Cu^{2+} ions are present.
2 a) Add aqueous ammonia until a change is observed. b) Add excess aqueous ammonia.	2 a) A light blue precipitate is formed. b) The light blue precipitate is soluble in excess reagent, forming a dark blue solution.	Cu^{2+} ions are present.
3) Add dilute nitric acid followed by an aqueous solution of barium nitrate.	There is no observed reaction. A precipitate is not formed.	SO_4^- ions are absent.
4) Add dilute nitric acid followed by an aqueous solution of silver nitrate.	A white precipitate is formed.	Cl^- ions are present.

• Give the formula of substance **H**? Copper(II) chloride, CuCl_2